SEPTEMBER 1989

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JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Do We Need More Generalists

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A Last Call for Self-Regulation

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HIV/AIDS Education in Medical Schools

Physicians in British Columbia

A Program to Teach Humanism

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Physicians Evaluate Their Education

Students' Expectations of the First Year

National Policy Perspectives

VOLUME 64 • NUMBER NINE

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SHORT PAPERS

Characteristics of Medical Schools and Their Affiliated Institutions

MARTHA R. ANDERSON, Ph.D., ROBERT F. DEDRICK, Ph.D., ROLAND G. HISS, M.D., and MARILYN A. BOWBEER

Abstract—Survey data from a sample of 58 U.S. and six Canadian medical schools were used to describe the current network of medical schools and their affiliates. Results showed that each medical school in the study averaged over 11 affiliates. The largest percentages of affiliates reported were in the categories of "community" hospitals (that is, the nongovernmental, not-for-profit hospitals), Veterans Administration hospitals, and city hospitals. Characteristics of the medical schools, such as class size, ownership, year established, and the presence of a university hospital, were not related to either the number or the kind of affiliates. However, the sizes of the affiliated institutions were associated with the year the medical school was established, the presence of a university hospital, and the class size of the medical school. *Acad. Med.* 64 (1989):543-545.

Health care institutions that have medical school affiliations have become a significant part of the medical education system. They provide substantial amounts of undergraduate and graduate medical education and allow medical schools to offer a variety of clinical settings and diverse curricula. Although affiliated institutions play an important role in medical education, no recent studies have examined the overall picture of the affiliated institutions' network.[1] The purpose of this study was to describe the current state of that network, particularly because the increasingly competitive nature of health care delivery has the potential to alter what may already be complicated or delicate relationships between medical schools and their affiliated institutions.

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Method

In 1984, the authors asked the deans of all 127 U.S. and 16 Canadian medical schools to indicate their interest in forming an informal group in order to share information and ideas about affiliations. Eighty-two U.S. and Canadian medical schools (57% of all the schools queried) became members at that time. Of those, 64 (78%) supplied information for this study by completing a self-administered questionnaire in 1985. Although the sample was self-selected, comparisons of selected characteristics (ownership of the medical school, geographic location by Association of American Medical Colleges — AAMC — region, the size of the entering class, and whether the school was established before or after 1960) of the sample with corresponding features of all U.S. and Canadian medical schools suggested that there were no systematic biases.

The survey instrument consisted of a series of closed-ended questions in which respondents were asked for information about the following:

1. Characteristics of the medical school: public or private ownership; established before or after 1960; existence of a university-owned hospital; geographic location by AAMC region; class size
2. Characteristics of the affiliated institution: bed size; ownership
3. Characteristics of the affiliated relationship: affiliation status (major, limited, graduate); level at which the affiliation was managed; existence of a formal affiliation agreement

Relationships among these characteristics were examined using both univariate and bivariate statistical analyses. Tests of significance were conducted at the .05 level.

Results

The results of the survey showed that the medical school-affiliate network was both large and diverse.

Characteristics of the School

The majority of the medical schools responding were public (67%), had been established in or before 1960 (64%), and had university-owned teaching hospitals (75%). The largest

proportion of the sample was from midwestern and northeastern medical schools (30% and 27%, respectively), and the smallest was from Canada (9%). Entering class sizes of the 64 schools ranged from 48 to 280, with a mean of 135. Fifty-eight percent of the schools had class sizes of 100–199.

The 64 medical schools were affiliated with a total of 731 institutions. The average number of affiliates per medical school was 11.4, the median was 8, and the range was from 3 to 40. Although the average number of affiliations per medical school did not differ greatly across the levels of the medical school characteristics, examination of the data reveals some interesting findings. For example, one might expect that medical schools established after 1960 would be mainly community-based schools and would have a larger number of major affiliates than would the traditional medical schools established prior to 1960. However, both groups had a mean number of 6.0 major affiliates, regardless of year established.

Characteristics of the Affiliated Institution

Regarding bed size, the average number of beds of the 570 affiliates that provided inpatient care was 370 with a range of 24 to 1,358 beds. As shown in Table 1, three medical school characteristics were related to the sizes of affiliates: (1) schools established in 1960 or before were affiliated with larger institutions (mean number of beds = 433) than those established after 1960 (mean number of beds = 350); (2) schools with university-owned hospitals were associated with larger institutions (mean number of beds = 433) than those without (mean number of beds = 324); (3) class size of the medical school showed a positive relationship to the size of the affiliate, that is, smaller medical schools were affiliated with smaller institutions (mean number of beds = 338), while larger medical schools were affiliated with larger institutions (mean number of beds = 471).

Information about the ownership of the affiliated institution was available for 724 institutions. Community hospitals (that is, the not-for-profit hospitals that are not government-owned) made up the largest proportion (67%) of affiliates. Government-owned hospitals, consisting

Table 1

Average Number of 731 Institutions, of the Beds in These Institutions, and of These Institutions in Each of Three Affiliation-Status Groups, in Terms of the Characteristics of the 64 Medical Schools with Which They Were Affiliated, 1985*

Medical School Characteristics†	Affiliated Institutions' Characteristics				
			Status		
	No.	No. Beds	Major	Limited	Graduate
Ownership					
Public (n = 43)	12.0	406.4	5.8	3.8	2.4
Private (n = 21)	10.2	406.9	6.4	2.4	1.0
Year established					
Before or during 1960 (n = 41)	12.2	432.8	6.0	3.6	2.1
After 1960 (n = 23)	10.1	349.6	6.0	2.8	1.5
University-owned hospital(s)					
Present (n = 48)	11.0	432.7	5.5	3.0	2.0
Not present (n = 16)	12.7	324.1	7.5	4.4	1.5
AAMC region					
Midwest (n = 19)	13.1	404.3	6.7	5.7	1.2
Northeast (n = 17)	12.2	368.7	7.4	2.9	1.3
South (n = 13)	10.2	457.5	3.8	2.6	3.5
West (n = 9)	9.2	404.7	5.8	0.4	2.3
Canada (n = 6)	9.8	415.8	5.2	3.2	1.5
Class size					
Less than 100 (n = 18)	11.5	337.7	5.8	2.9	2.9
100–149 (n = 20)	11.2	369.3	5.6	3.6	2.0
150–199 (n = 17)	10.8	465.6	5.3	2.3	0.9
More than 199 (n = 9)	13.1	471.1	7.4	5.0	1.1

*The table presents the average number of five characteristics of the institutions that were affiliated with the medical schools, in terms of five characteristics of these schools. For example, 43 public medical schools were affiliated with an average of 12 institutions each, which had an average of 406.4 beds; of that 12 institutions, 5.8 were major affiliates, 3.8 were limited affiliates, and 2.4 were graduate affiliates.

†The authors sent questionnaires regarding affiliations to 82 U.S. and Canadian schools.

of city hospitals (9%), Veterans Administration (VA) hospitals (8%), and state- or province-owned hospitals (8%), constituted the second largest proportion of affiliates.

Characteristics of the Affiliated Relationship

Of the 707 institutions for which data were available, 54% were major affiliates, 30% were limited affiliates, and 17% were graduate affiliates. On the average, medical schools had six major affiliates, with a range of one to 35; three limited affiliates, with a range from none to 22; and two graduate affiliates, with a range from none to 23.

A relationship was found between the ownership of the affiliate and its affiliation status. Eighty-four percent of VA hospitals were major affiliates, and over half (55%) of nongovernmental, not-for-profit hospitals were major affiliates, as were 54% of city hospitals. Over half (54%) of state hospitals had limited affiliations, while 77% of for-profit hospitals were graduate affiliates of medical schools.

A relationship was found between the bed size of affiliates and their affiliation status. Graduate affiliations were often found in smaller institutions (mean number of beds = 286), limited affiliations in slightly larger ones (mean number of beds = 349), and major affiliates were reported to have the most beds (mean number of beds = 398).

Regarding affiliation management, in 1977, the authors of the Medical School-Clinical Affiliation Study[2] recognized the growing trend for affiliations to be managed by the medical school rather than by the individual department. Survey results confirmed that the management of affiliations is largely an institutional rather than a departmental concern. Among the 667 affiliated institutions for which there were data, 87% of affiliations were managed centrally by either the university or the medical school and only 13% were departmentally managed.

Formal affiliation agreements have come to be accepted as a matter of course. Ninety-five percent of affiliations (655 out of 693) were covered by a formal affiliation.

Discussion

Although this study confirms that the medical school-affiliated hospital network in 1985 was both large and diverse, it also shows that knowledge of medical school characteristics does little to enhance understanding of medical education networks. None of the characteristics of medical schools used in this study (size, region, ownership, presence of the university hospital, class size, or year established) was related to the number of affiliations.

The importance of the affiliate in medical education is likely to grow in the next decade. Graduate medical education has increasingly been conducted in institutions affiliated with medical schools.[3] In addition, major changes in health care delivery, and, therefore, in medical education, are occurring as providers and policymakers deal with increasing health care costs. Hospitals that cooperate in medical education programs compete with one another for patients. The affiliation created to serve medical educational needs is being joined by "network arrangements" that have a clinical, not educational, purpose. The degree to which traditional educational affiliations will interact with, complement, or compete with clinical networks remains to be seen.

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AAMC DATA REPORT

HIV/AIDS Education in U.S. Medical Schools

The prevalence of the human immunodeficiency virus (HIV) and the acquired immunodeficiency syndrome (AIDS) has created a need for physicians prepared to aid in preventing the epidemic's spread and to care for those already infected. In order to learn how medical schools were responding to this need, in the fall of 1988 the Association of American Medical Colleges (AAMC) asked the deans of U.S. medical schools to complete a survey on the integration of HIV/AIDS-related topics into the medical school curriculum. Respondents at 107 of the 127 accredited schools completed the form, for a response rate of 84 percent. Two schools' data were reported in a form that proved unusable in the summary analyses. The responses of the remaining 105 schools are summarized here.

The survey form identified 14 HIV/AIDS-related topics and requested information concerning (1) where each topic was covered (course/clerkship), (2) who was responsible for covering it (responsible department), (3) the number of hours of instruction devoted to it, and (4) the curriculum year in which it was covered. Table 1 lists the responses to the first three of these questions. The topics appear in decreasing order of the number of schools that affirmed that they were covered. For instance, all 105 schools reported that "characteristics of retroviruses" was covered; some schools named more than one course, and thus this topic was covered in a total of 180 courses. The second column of information in the table shows the courses most frequently mentioned as covering the topic, and the third column names the departments most frequently reported as responsible for the teaching. The fourth column is a frequency distribution of hours of instruction devoted to the topic, including the median and mode.

It is clear that microbiology and immunology courses assume a large responsibility for teaching students about HIV infection. In addition to covering the basic science of retroviruses, immunologic aspects of infection, and pathogenesis, these courses incorporate information about the epidemiology of infection and modes of transmission, diagnostic testing, and treatment approaches. Although virtually all schools affirmed coverage of basic science and clinical aspects of HIV infection, this was less true of coverage of infection control procedures (88%); behavioral issues related to homosexuality and drug abuse (83%); physicians' professional responsibilities (79%); and psychosocial and cultural aspects of AIDS (74%).

The survey also asked respondents to estimate the percentages of AIDS patients among those seen by students at sites of the medicine and pediatric clerkships. The following summary of these responses refers only to the clerkship site with the *highest* frequency of AIDS cases and probably reflects an upper boundary to estimates of medical student experience in the care of AIDS patients. Only 57 schools reported data regarding pediatrics clerkships, and 45 (79%) of these responded that pediatric AIDS cases accounted for less than 5% of the patient population; the median frequency was 1%. Eighty-five schools reported data on medicine clerkships, with 40 (47%) of these indicating that AIDS cases accounted for less than 5% of patients. Twelve schools reported 10% of patients, and another 12 schools reported even higher percentages; the median was 5%.

Additional analyses were conducted to determine whether medical schools located in the epicenters of the epidemic

Table 1

Coverage of HIV/AIDS-Related Topics in the Curricula at 105 U.S. Medical Schools, 1988*

Topic (No. of Schools/No. of Courses*)	Course or Clerkship (Frequency of Mention)	Responsible Department (Frequency of Mention)	Hours of Instruction		
Characteristics of retroviruses (105/180)	Microbiology/immunology (95) Pathology (17) Virology/retrovirus (11)	Microbiology/immunology (88) Pathology (17) Medicine clerkship (12)	<1 8 1–2 59 3–4 13 5–9 12 ≥10 2 NI† 17	median mode	2.0 1.0
Immunological aspects of HIV infection (104/197)	Microbiology/immunology (80) Pathology (22) Medicine clerkship (12) Introduction to clinical medicine (8)	Microbiology/immunology (70) Pathology (29) Medicine (27)	<1 15 1–2 63 3–4 10 5–9 5 ≥10 3 NI† 17	median mode	1.5 1.0
Modes of transmission/preventing transmission (103/247)	Microbiology/immunology (54) Introduction to clinical medicine (19) Medicine clerkship (17)	Microbiology/immunology (54) Medicine (44)	<1 20 1–2 47 3–4 21 5–9 7 ≥10 5 NI† 20	median mode	1.6 1.0

Table 1 continued

Coverage of HIV/AIDS-Related Topics in the Curricula at 105 U.S. Medical Schools, 1988*

Topic (No. of Schools/No. of Courses*)	Course or Clerkship (Frequency of Mention)	Responsible Department (Frequency of Mention)	Hours of Instruction		
Treatment approaches to AIDS and simultaneously occurring infections (97/203)	Medicine clerkship (35) Microbiology/immunology (31) Pharmacology (24) Introduction to clinical medicine (14)	Medicine (51) Microbiology/immunology (31) Pharmacology (24)	<1 1–2 3–4 5–9 ≥10 NI†	9 54 16 4 4 30	median 2.0 mode 1.0
Other pertinent ethical issues (e.g., confidentiality, informed consent, duty to warn) (94/181)	Ethics (32) Medicine clerkship (15) Introduction to clinical medicine (11)	Medicine (29) Psychiatry (14) Family medicine (13)	<1 1–2 3–4 5–9 ≥10 NI†	11 47 8 12 10 37	median 2.0 mode 1.0
Infection-control procedures for healthcare workers (92/205)	Other clerkships (29) Microbiology/immunology (26) Medicine clerkship (21) Introduction to clinical medicine (20) Infectious diseases (6)	Medicine (39) Microbiology/immunology (26) Infectious disease/infection control (9)	<1 1–2 3–4 5–9 ≥10 NI†	21 42 13 5 6 22	median 1.0 mode 1.0
Behavioral issues related to homosexuality and intravenous drug abuse (87/157)	Behavioral science (23) Psychiatry clerkship (19) Introduction to psychiatry (16)	Psychiatry (57) Family medicine (9) Community health (5)	<1 1–2 3–4 5–9 ≥10 NI†	9 36 12 10 8 6	median 2.0 mode 1.0
Epidemiology of HIV infection (102/234)	Microbiology/immunology (62) Epidemiology/community health (34) Pathology (20) Introduction to clinical medicine (16)	Microbiology/immunology (60) Medicine (33) Public health (28) Pathology (18)	<1 1–2 3–4 5–9 ≥10 NI†	15 44 24 8 5 16	median 2.0 mode 1.0
Pathogenesis of disease (102/227)	Pathology (56) Microbiology/immunology (53)	Pathology (50) Microbiology/immunology (45)	<1 1–2 3–4 5–9 ≥10 NI†	12 49 20 9 3 15	median 2.0 mode 1.0
Diagnosis, including serologic testing procedures (100/232)	Microbiology/immunology (64) Pathology (30) Introduction to clinical medicine (19) Medicine clerkship (17) Other clerkship (15)	Microbiology/immunology (59) Pathology (34) Medicine (34)	<1 1–2 3–4 5–9 ≥10 NI†	10 51 13 12 5 23	median 1.5 mode 1.0
Taking a sexual history (99/172)	Introduction to clinical medicine (33) Physical diagnosis (16) Human sexuality (16) Obstetrics/gynecology clerkship (15)	Psychiatry (39) Medicine (33) Obstetrics/gynecology clerkship (19)	<1 1–2 3–4 5–9 ≥10 NI†	13 47 25 4 1 30	median 2.0 mode 2.0
Professional responsibility of physicians to care for HIV-infected persons (83/158)	Ethics (24) All other clerkships (18) Medicine clerkship (14) Introduction to clinical medicine (10)	Medicine (28) Family medicine/community practice (17) Psychiatry (12)	<1 1–2 3–4 5–9 ≥10 NI†	13 37 11 12 1 35	median 1.5 mode 1.0

continued

Table 1 continued

Coverage of HIV/AIDS-Related Topics in the Curricula at 105 U.S. Medical Schools, 1988*

Topic (No. of Schools/No. of Courses*)	Course or Clerkship (Frequency of Mention)	Responsible Department (Frequency of Mention)	Hours of Instruction		
AIDS in the pediatric age group (81/120)	Pediatrics clerkship (59) Microbiology/immunology (10)	Pediatrics (67) Microbiology/immunology (6)	<1 1–2 3–4 5–9 ≥10 NI†	10 44 7 2 0 26	median 1.1 mode 1.0
Other psychosocial and cultural aspects of AIDS (78/142)	Behavioral science (17) Psychiatry clerkship (15) Introduction to clinical medicine (7)	Psychiatry (39) Medicine (17)	<1 1–2 3–4 5–9 ≥10 NI†	9 45 8 6 7 22	median 1.5 mode 1.0

*Most schools reported that the topic was covered in more than one course; hence the number of courses indicated in all cases is greater than the number of schools.
†NI = no information.

tended to provide more hours of instruction in HIV/AIDS than did other schools. Twenty-five medical schools were identified as located in the ten standard metropolitan statistical areas (SMSA) with the highest numbers of recorded AIDS cases, as reported by the Centers for Disease Control.[1] A comparison of these schools with the other 80 medical schools revealed that, for 11 of the 14 topics, the schools located in the epicenters reported on average more instructional time, particularly on the following topics: infection control procedures (3.9 vs. 2.2 hours), modes of transmission (3.2 vs. 2.4), pathogenesis (3.4 vs. 2.3), treatment approaches (3.5 vs. 2.3), behavioral issues related to homosexuality and intravenous drug abuse (4.7 vs. 3.3), and ethical issues related to HIV/AIDS (4.8 vs. 3.9).

Due to the nature of the epidemic, medical students' experience in caring for patients with AIDS varies widely across the country. However, the processes of integrating HIV/AIDS-related topics in the medical school curriculum appears to be well under way at all medical schools responding to the survey. While responsibility for addressing HIV/AIDS in the curriculum also varies from school to school, the following departments were most frequently involved: microbiology/immunology, pathology, medicine, and psychiatry. As the HIV epidemic unfolds, the need for AIDS-related instruction will increase, particularly with regard to the basic attitudes and skills described in the report, *The HIV Epidemic and Medical Education*, by the AAMC Committee on AIDS and the Academic Medical Center.[2]

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To receive an expanded report of the survey results, contact Janet Bickel at 202/828-0575.

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